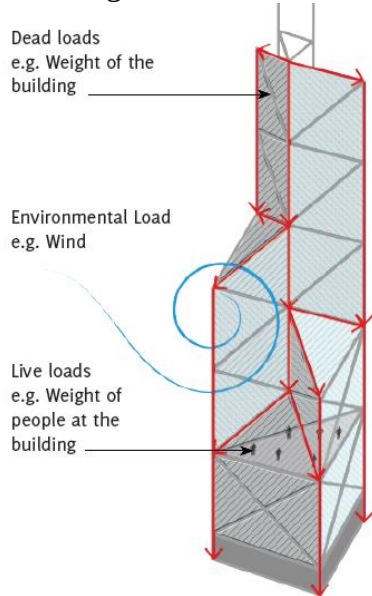


The Bank of China Tower

The Bank of China Tower was built in Hong Kong, 1989 by Architect: I.M. Pei on the 8000 m² plot Area with the 370m eight. The glass façades of the building reflect the light and its surroundings, so it is like a bright and shiny white crystal. The whole structure is supported by the four steel columns at the corners of the building and one in the center of the building, with the triangular frameworks transferring the weight of the structure onto these five columns. It is covered with glass curtain walls.



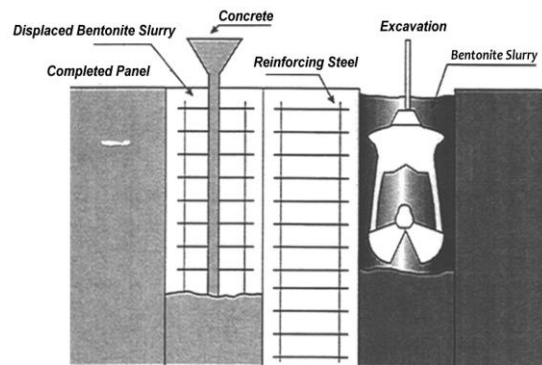
Loads action effected to the high rise building

Bank of China Tower (Under construction)

2. The Designing resists wind load and/or earthquake

The foundation

It was set by several caissons. The caisson foundation consists of concrete columns constructed in cylindrical shafts excavated under the proposed structural column location. It carries the building load at their lower end, which are often bell-shaped. Concrete is placed(poured)into steel forms built up along the perimeter of the box

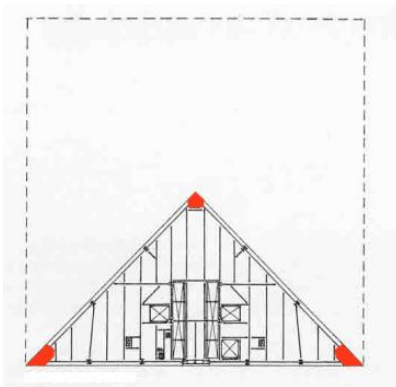


Column

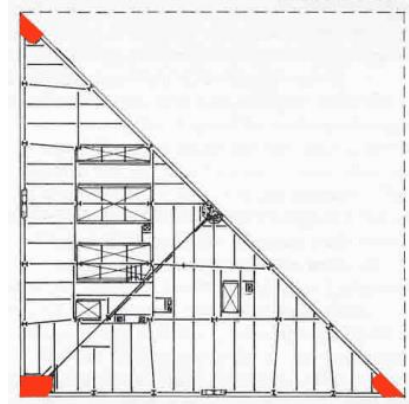
The shape causes eccentric load. Off-center loads would cause excessive stresses in columns. The solution is that using uniform shear force mechanism that could counteract and eliminate the bending. The system is outstanding of its economy of material.

Shear Wall

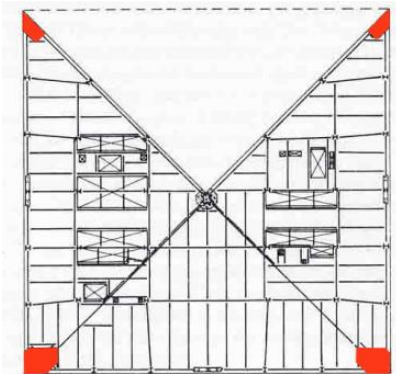
Only a small portion of the loads carried to the service cores in the lower floors flows directly to the foundations.



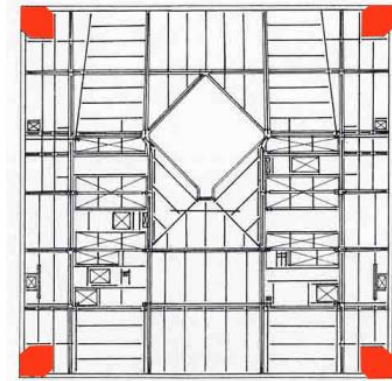
Story 51 and 52



Story 38



Story 25



Story 4

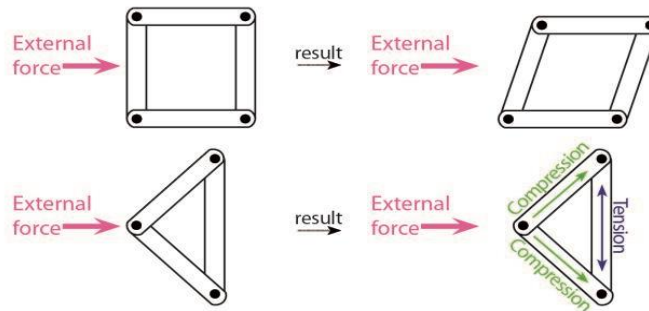
- **Cross braces methode**

The architect used a less steel for the building's construction. The cross braces and triangular framework of the building are designed to withstand typhoons and make structurally effective:

- Triangular shape as most structural stable geometry
- Carries building load, and reduces use of steel by 30% as compared to typical column and beam system

✚ Truss

- Common structural element in architecture.
- **Steel** members are joined together into **triangular shapes**, which are able to **resist external forces**.
- When joined together, these triangles can form large truss systems that can **span long distances**.



☉ Earthquake

There are a number of strategies that can be used to reduce the impact of earthquakes in this building. the building can never be made totally earthquake proof. However there are a number of ways that existing buildings can be made more resistant to earthquake damage.

New building can be designed to have a number of structural features which are more likely to provide resistance to the damaging effects of earthquakes. Structural damage could still occur, but the safety of the people inside the buildings is greatly enhanced by these special features.

• Base isolation

This works by essentially separating the building from the moving ground during an earthquake. It will move with the ground, but the movement to the rest of the building is minimised by the provision of special features.



Base Isolation system

• Diagonal Bracing

Shearing forces as distinct to push and pull forces, can cause tremendous damage to buildings. Diagonal bracing helps to minimise the effect to these shearing forces during an earthquake.



• Passive damping

It involves using a range of techniques. The main objective is to absorb the energy without allowing it to impact on the main structure of the building. Certain methods use materials which will deform easily and therefore absorb the energy, without breaking. Other techniques include the use of large masses which are

made to move out of phase with the movement caused by the earthquake. This tends to cancel out the disturbance, just like a trough of a wave in water meeting a crest of the wave will result in calm water(Destructive interference in waves...)

Reference : <http://slideplayer.com/slide/10483437/>
<https://www.slideshare.net/Tarique048/caisson-foundationppt>
<https://www.slideshare.net/tudorgeog/earthquake-3-ps-nsr>